

What Is Claimed Is:

1. A method for removing CO from a hydrogen-rich mixture gas by a selective oxidation, which comprises the following steps:
 - a) preparing a zeolite catalyst carrying Pt or Ru;
 - 5 b) flowing a CO-containing hydrogen-rich mixture gas and an oxygen-containing gas through said zeolite catalyst carrying Pt or Ru; wherein the process of preparing said zeolite catalyst carrying Pt or Ru in Step (a) comprises the following steps:
 - a1) mixing a zeolite with an aqueous solution containing Pt ions or Ru ions in an amount of said aqueous solution so that said zeolite is subjected to an incipient wetness impregnation, provided that said zeolite is not A-zeolite; and
 - 10 a2) heating said incipient wetness impregnated zeolite so that only Pt ions or Ru ions in said aqueous solution are deposited to said zeolite.
- 15 2. The method as claimed in Claim 1, wherein the amount of said aqueous solution in Step (a1) used enables said zeolite to be incipient wetness impregnated with 0.5-5.0 wt% of Pt ions or Ru ions based on the weight of the zeolite.
- 20 3. The method as claimed in Claim 1, wherein said zeolite in Step (a1) is a Y-zeolite , a ZSM zeolite or a Mordenite zeolite.
4. The method as claimed in Claim 3, wherein said zeolite in Step (a1) is a Y-zeolite.
- 25 5. The method as claimed in Claim 1, wherein the heating in Step (a2) comprises drying said incipient wetness impregnated zeolite at 100-120°C, and calcining said dried zeolite at 400-600°C.

6. The method as claimed in Claim 1, wherein said CO-containing hydrogen-rich mixture gas and said oxygen-containing gas in Step (b) has a temperature of 50~250°C.

5 7. The method as claimed in Claim 1, wherein said CO-containing hydrogen-rich mixture gas in Step (b) is a hydrogen-rich reformate gas obtained by reforming a hydrocarbon, and a hydrogen-rich reformate gas having a reduced CO concentration exiting from said zeolite catalyst carrying Pt or Ru is introduced into a fuel cell.

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8. The method as claimed in Claim 1, wherein said zeolite catalyst carrying Pt or Ru in Step (b) is surrounded by an atmosphere having a molar ratio of oxygen to CO of 0.5~2.

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